Physics 215 Fall 2023: Course Syllabus

Why is the syllabus so long?

Yes, I know this is long, but it has all the information you need for the course in one easy-to-search place. Please read it just once (Please!). If you don't, there's a good chance you'll send me an email asking about something that is clearly answered here, and then I'll spend time answering those emails instead of helping you with learning physics.

Time/place:

Lecture: Tu/Th 11:00am-12:20pm, Physics 106
Recitation: M/W 6:45-8:05PM, Physics 208

Instructors

Professor: Dr. Lisa Manning

- email: mmanning@syr.edu (Please read the email policy first.)
- office: Physics 229B (in the soft matter suite near Phys 208)
- office hours:
  - Wednesdays, 9-10am
  - Thursdays 1-2pm
- pronouns: she/her/hers
- Course website: blackboard, sign in using netid and password
- Professor Manning's research website

Teaching Assistant: Sourav Roy

- email: sroy08@syr.edu
- pronouns: he/him/his
- office hours: Thursdays 11am-1pm, Physics Clinic 104S

Peer Coach: Jada Garofalo

- email: jagarofa@syr.edu
- pronouns: they/them
- office hours: Fridays TBD, Physics Clinic 104S

Required Materials

The textbook. OpenStax University Physics Vol 1

Good news: your textbook for this class is available for free online, in web view and PDF format! You can also purchase a print version, if you prefer, via the campus bookstore or from OpenStax on Amazon.com.

You can use whichever formats you want. Web view is recommended. If you buy on Amazon, make sure you use the link on your book page on openstax.org so you get the official OpenStax print version. (Simple printouts sold by third parties on Amazon are not verifiable and maybe not as high-quality.)

University Physics Volume 1 from OpenStax, ISBN 1938168275, www.openstax.org/details/university-physics-volume-1

Description and Learning Objectives

The first-year majors' courses are an essential preparation for your four-year metamorphosis from student to physicist. Thus, it is important that we create a good foundation of basic language, conceptual understanding, analytical skills, and experimental skills that you will continue to learn, hone, and use throughout your time as a physics major. My goal is to impart the following:

- Construct and use analytical (mathematical) models or representations of the real world in order to explain, analyze, and predict physical phenomena (especially related to mechanics).
- Reason through new problems logically, creatively, and independently.
- Identify fundamental principles, theories, and concepts related to mechanics.
- Interpret information in the form of mathematical expressions (formulas or sets of formulas) and graphical expressions (graphs, tables, schematics).
- Ability to draw inferences and make predictions from mathematical and graphical expressions.
- Use algebra, trigonometry, and calculus to solve problems analytically.
- Estimate and reflect on your answers to problems either mathematically or graphically in order to determine if your solution or result is reasonable for physical phenomena in mechanics.

This course is primarily about the motion of objects and the forces that govern this motion. Examples include "free fall", collisions between objects (such as cars), rolling, and sound waves. These ideas provide a foundation for all of modern physics as well as engineering and natural sciences.

A list of specific topics covered and the reading schedule can be found later in the syllabus.

Expectations

We want this class to be engaging and useful to you. This course is taught in an active learning style because studies have shown that this style is the best and most effective method to teach you. This means that there is a reading assignment before every lecture, and you're expected read that section before class so that you're prepared to engage actively with the material in class. Some students learn better from other modalities, and prefer to google the topic and look for online videos related to the reading on sites like Khan Academy. I will award extra credit to any students who post useful video resources ahead of time on our course blackboard page. On

“lecture” days, you will spend a large fraction of the time working in small groups to practice in real time what we are learning. On “recitation” days, you will continue working in small groups and the TA can help clear up misconceptions. Your homework should be easier and faster, if we do it this way.

We expect you to:

- attend lectures and recitations and participate in active group work
- spend about two to three hours working outside of class for every hour in class -- That's about 6-9 hours a week.
- complete the assigned reading before every class

Pre- and Co-requisites

Working knowledge of high school level algebra and trigonometry is required. Calculus will also be used. Calculus is covered in the co-requisite course (MAT 285 or MAT 295). We will also be going over the calculus ideas in our class.

Students are required to enroll in the laboratory course PHY 225 (or in 221 with permission from the instructor, see last paragraph below). Your grade in PHY 215 may be withheld if you don't co-register for the laboratory.

Grading

Your course grade will be determined as follows:

- Class participation (in-class attendance and small group work, recitation attendance and participation) - 20%
- Assignments (HW) - 30%
- 3 midterm exams (lowest one dropped) - 30%
- 1 final (comprehensive) - 20%
- extra credit opportunities provided throughout the semester

Grades will be kept and updated on the course blackboard page. **You are responsible** for checking the grades as they appear and making sure that they are correct. Contact your TA immediately if you think that one of the entered grades is incorrect, because we can not guarantee that will be able to change them if we aren't notified immediately. If you would like to contest a grade on a HW or exam, please fill out the regrading form.

The grading scale is as follows:

A 100-94%
A- 93-90%
B+ 89-87%
B 86-84%
B- 83-80%

C+ 79-77%
C 77%-74%
C- 73-70%
D+ 69-67%
D 67%-60%
F Below 60%

Participation:

Your in-class participation grades will be based on the following: attending class, your ability to answer questions in class based on your reading the assignment before coming to lecture, your contributions and participation in small group work and class discussions. Please bring a scientific calculator (your phone is fine) with you to class. Participation is graded on a *check+, check, check-* scale for every class. The lowest three in-class participation scores will be dropped.

Recitations

There are two one-hour recitation sections each week in which you will work in teams with a teaching assistant and peer coach to learn and practice problem solving skills, especially related to misconceptions we identify during lecture. Attendance is required, and a participation grade will be assessed based on your participation in group work. The lowest 3 recitation participation grades will be dropped.

Assignments

The HW assignments make up 30% of your grade. I have found that when homework is done online, it is more difficult to learn how to write a good, long-answer solution to the problems, resulting in poorer grades on exams and difficulty with future courses. Therefore, our homework will generally be a subset of problems from the textbook (and an extra one I make up so you absolutely can't find the answers online). Homework assignments from the previous week are **due to your TA at 5pm on Friday to the TA's mailbox**. There will be two components to the homework scores – a "completeness component" based on the number of problems that you reasonably attempted and a "correctness component" where a few (randomly chosen) problems from the set will be carefully graded by hand in a manner similar to your exam. Solutions to homework problems will be provided at the course web site. The two lowest HW grades will be dropped.

Note: I know you can find the answers to almost any textbook problem online, or using ChatGPT. I still like to use some textbook problems because many of them are quite excellent for developing your skills as a physicist. I am going to treat you with respect and assume that you will not use those online answer keys or AI. Not only does it violate our academic integrity policy (see below), but often there are "tells" – small mistakes or unusual notation in those online keys (or ChatGPT solutions taken from online solutions) so I can tell you are using them. To mitigate this issue, I also make up some of my own problems for HW and exams, and so if you perform quite differently on those I have to go looking for the reason. Finally, using them prevents you

from engaging with the material to grow as a physics major or honors student (and really, isn't that the point?) So, just don't do it. Not worth it.

Exams

There will be three eighty-minute midterm exams during the semester. Each exam will focus on material from the three or four weeks prior to the week of the exam but may include earlier material as well. **The lowest midterm score for each student will be dropped**. In addition, there will be a two-hour final. The final exam will be comprehensive. All exams will be closed book. **There will be *NO* makeup exams.** Students who do not take the final or who miss more than one of the other exams will *not* be given a passing grade. Dates for the exams are:

Midterm 1: Tuesday, Sept 28
Midterm 2: Thursday Oct 26
Midterm 3: Thursday, Nov 16 (Thursday before Thanksgiving break)
(all midterms are during regular class times)

Final exam: Monday, Dec 18 7:30-9:30pm

Note: no accommodations will be made for students who book travel that conflict with these dates.

Tentative schedule

Below is a tentative schedule for topics to be covered in the course, associated chapters in your OpenStax textbook. This is subject to change; please see course website for an updated schedule as the course proceeds.

Week	**First lecture**	**reading**	**Second lecture**	**reading**
1	1-1: Review and Units	1.1-1.7	1-2: 1D motion	3.1-3.4
2	2-1: More Motion and vectors	3.5, 2.1-2.2	2-2: Vectors	2.1-2.3
3	3-1: Projectile motion	4.1-4.3	3-2: Circular motion	4.4
4	4-1: relative motion	4.5	4-2: Forces	5.1-5.3
5	5-1: Forces, weight	5.4-5.5	**5-2: Midterm 1: Thursday Sept 28th**	
6	6-1: Friction, Drag	6.2, 6.4	6-2: Newton's 3rd law	5.5, 6.1
7	Tuesday Oct 10, No class: fall break		7-1: Newton's laws in 2D	6.1,6.3
8	8-1: momentum and collisions	9.1-9.4	8-2: Work and kinetic Energy	7.1-7.3

9	9-1: Work and Power	7.3-7.4	9-2: **Midterm 2, Thursday Oct 26**	
10	10-1: Potential energy	8.1-8.5	10-2: Rotation	10.1-10.3
11	10-2: Extended objects	9.6, 10.4-10.5	11-1: Torque	10.6-10.8
12	12-1: Angular momentum	11.1-11.3	12-2: **Midterm 3, Thursday Nov 16th**	
13	**Thanksgiving break**			
14	14-1: Equilibrium and statics	12.1-12.2	14-2: Newtonian gravity	13.1-13.5
15	15-1: Oscillations	15.1-15.6	15-2: Waves	16.1-16.6
16	16-1: Sound	17.1-17.8		
17		Final exam: **Mon, Dec 18, 7:30pm-9:30pm**		

Email Policy:

All emails sent to the instructors (Professors or TA) should be respectful and professional. They must include "Physics 215" in the subject line and should include a salutation ("Dear Professor"), a closing ("Best" or "Sincerely") and your full name. (This is just common sense for all professional communications!)

The instructors will make an effort to respond to emails within a reasonable timeframe, usually 24 hours. However, emails that require action about events or assignments due in less than 24 hours will not receive a response.

Disability-Related Accommodations:

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to meet with me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability-accommodations or register with CDR, please visit their website at https://disabilityresources.syr.edu. Please call (315) 443-4498 or email disabilityresources@syr.edu for more detailed information.

CDR is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact CDR as soon as possible to begin this process.

Academic Integrity Policy:

For homework assignments, you can (and are encouraged to) work with other students in the class, but you cannot directly copy answers from them. If I identify homework with exactly the same answers including formatting and errors, that is a violation of academic integrity.

It is a violation of the academic code to seek or give assistance during the exams. The instructor is the only person you can communicate with during the tests. Please do not make any changes or marks to the graded exams, if you want to preserve a right to appeal grading mistakes.

Syracuse University's academic integrity policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The university policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same written work in more than one class without receiving written authorization in advance from both instructors. The presumptive penalty for a first instance of academic dishonesty by an undergraduate student is course failure, accompanied by a transcript notation indicating that the failure resulted from a violation of academic integrity policy. The presumptive penalty for a first instance of academic dishonesty by a graduate student is suspension or expulsion. SU students are required to read an online summary of the university's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. For more information and the complete policy, see the Academic Integrity Policy.

Religious observances policy:

SU religious observances notification and policy, found at http://hendricks.syr.edu/spiritual-life/index.html, recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the Academic/Financial deadline to drop class for regular session classes and by the submission deadline for flexibly formatted classes.

For fall and spring semesters, an online notification process is available for students in My Slice under Enrollment > Religious Observances.

Ally Statement:

I have participated in the safer spaces training program through the LGBT center at Syracuse University. Please let me know if you use a different name than the one that shows up on my roster, and also let me know the pronouns that you use. I strive to use gender-neutral language in the classroom (e.g. your classmate, singular they), but I am not always successful. Feel free to correct me if I make a mistake.

Physics Clinic:

Physics Clinic is operated in room 104S of the Physics Building. Hours are posted on the door and online. The clinic is staffed by graduate Teaching Assistants who can help you with this course. Preferably come to the clinic when the TA assigned to this class holds their hours. However, this is not a requirement and you can drop in at any time for help.

Laboratory Course PHY225:

You must co-register for the laboratory course PHY225 (or in 221 with permission from the instructor). Your grade in PHY215 may be withheld if you don't co-register for the laboratory. PHY225 will provide you with hands-on experience with the physical phenomena discussed in this course (PHY215) and introduce you to the measurement process. The PHY225 course is graded separately. Prof. Paulsen (jdpaulse@syr.edu) is in charge of the PHY225 course.